

## **REMARKS**

Claims 1-32 are pending in the present application. Claims 1-2, 8-11, 13-19, 25-27, and 29-32 were rejected under 35 U.S.C. §102(b), and claims 3-7, 12, 20-24, and 28 were rejected under 35 U.S.C. §103(a). Applicant has amended claims 1, 4, 17, and 21, and has canceled claims 3 and 20. No new matter has been introduced.

### **Section 102 Rejections**

Claims 1-2, 8-11, 13-19, 25-27, and 29-32 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,888,885 (Xie).

Applicant urges that independent claims 1 and 17 are not anticipated by Xie for at least the reasons presented below.

At the very least, Xie does not disclose or suggest a method for growing a quantum dot on a substrate by *forming a nucleation site . . . using a focused ion beam wherein an electronic microscope is used to align said ion beam on said predetermined area*, as essentially claimed in claims 1 and 17.

Xie is directed to forming 3-dimensional arrays of quantum dots. The Examiner cited Xie as disclosing forming nucleation sites on a surface by implantation of ions and growing quantum dots on the nucleation sites. In particular, Xie discloses masking the substrate, opening a line and exposing the unmasked region of the substrate to ion implantation. Xie further discloses techniques for forming three-dimensional arrays of quantum dots. The Examiner acknowledged that Xie does not disclose ion implantation using an FIB, and cited Kato as disclosing this limitation. The Kato reference is discussed below. However, neither Xie alone, not the combination of Xie and Kato, disclose or suggest using a FIB with an *electron microscope . . . to align said ion beam on said predetermined area*, so that nucleation sites can be aligned with a pre-existing pattern on the substrate. Thus, Applicant urges that Xie does not anticipate claims 1 and 17. Reconsideration and withdrawal of these rejections are respectfully requested.

## Section 103 Rejections

Claims 3-7 and 20-24 were rejected under 35 U.S.C. § 103(a) as obvious over Xie in view of U.S. Patent No. 5,532,184 (Kato).

Claims 12 and 28 were rejected under 35 U.S.C. § 103(a) as obvious over Xie in view of U.S. Patent No. 6,351,007 (Fukushima, *et al.*).

Applicant urges that dependent claims 3-7 and 20-24 are not obvious over Xie and Kato for at least the reasons presented below.

The Examiner conceded that Xie does not disclose *implantation of ions . . . using a focused ion beam*, as recited in claims 3 and 20, and a *nucleation site comprises a spot formed on the substrate, and the diameter of the spot is less than about 80 nm*, as essentially recited in claims 7 and 24. The Examiner cited Kato as disclosing these limitations.

Kato is directed to fabrication semi-conductor devices using quantum dots or wires. Although Kato discloses using a focused ion beam for implanting dot-like or wire-like pattern of ions on a semi-conductor layer, Kato nowhere discloses or suggests using *forming a nucleation site . . . using a focused ion beam wherein an electronic microscope is used to align said ion beam on said predetermined area*, as essentially recited in independent claims 1 and 17. This has the advantage of aligning nucleation sites with a pre-existing pattern on the substrate. Kato nowhere discussed aligning nucleation sites with an existing pattern on a substrate. Applicant urges that since Xie and Kato do to disclose of suggest of the limitations of claims 1 and 17, these independent claims are not obvious over the combination of Xie and Kato, and dependent claims 3-7 and 20-24 are not obvious over Xie and Kato. Reconsideration and withdrawal of these section 103 rejections are respectfully requested.

Applicant urges that dependent claims 12 and 28 are not obvious over Xie and Fukushima for at least the reasons presented below.

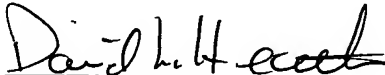
The Examiner conceded that Xie does not disclose a Ge island *grown by introducing digermane gas onto the substrate at a substrate temperature in a range of about 550 °C to about 650 °C and digermane pressure in a range of about 10<sup>-8</sup> Torr to about 10<sup>-6</sup> Torr*, as recited in claims 12 and 28, but cited Fukushima as disclosing this limitation.

Fukushima is directed to forming quantum thin lines. However, there is no disclosure or suggestion in Fukushima of using *forming a nucleation site . . . using a focused ion beam wherein an electronic microscope is used to align said ion beam on said predetermined area*, as essentially recited in independent claims 1 and 17. Applicant urges that since Xie and Fukushima do not disclose or suggest the limitations of claims 1 and 17, these independent claims are not obvious over the combination of Xie and Fukushima, and dependent claims 12 and 28 are not obvious over Xie and Fukushima. Reconsideration and withdrawal of these section 103 rejections are respectfully requested.

## CONCLUSION

Applicant urges that claims 1-2, 4-19, and 21-32 are in condition for allowance for at least the reasons stated. Early and favorable action on this case is respectfully requested.

Respectfully submitted,

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